

Application Ser. No. 09/816,941

Art Unit 2871

IN THE CLAIMS

Please amend the claims to read as indicated herein.

Please cancel claim 10.

1. (previously presented) A liquid crystal device comprising:
a first cell wall and a second cell wall enclosing a layer of liquid crystal material;
electrodes for applying an electric field across at least some of said liquid crystal material; and
a surface alignment structure on the inner surface of at least said first cell wall providing a single desired alignment to a liquid crystal director;
wherein said surface alignment structure comprises a two dimensional array of alignment posts which are at least one of shaped and orientated to produce the desired alignment.
2. (previously presented) A device as claimed in claim 1, wherein said posts have a height in the range of about 0.5 to 5 μm .
3. (previously presented) A device as claimed in claim 1, wherein said posts have a height in the range of about 1.0 to 1.2 μm .
4. (previously presented) A device as claimed in claim 1, wherein at least part of a side wall of said posts is tilted with respect to the normal to the plane of the first cell wall.
5. (previously presented) A device as claimed in claim 1, wherein each post has a width in the range of about 0.2 to 3 μm .
6. (previously presented) A device as claimed in claim 1, wherein said posts are spaced from about 0.1 to 5 μm apart from each other.

Application Ser. No. 09/816,941

Art Unit 2871

7. (original) A device as claimed in claim 1, wherein the liquid crystal material contains a surfactant.

8. (previously presented) A device as claimed in claim 1, wherein said posts are formed from at least one of a photoresist or a plastics material.

9. (previously presented) A device as claimed in claim 1, wherein said posts are of at least one of a different height, different shape, different tilt and different orientation in different regions of the device.

10. (canceled)

11. (previously presented) A cell wall for use in manufacturing a liquid crystal device according to claim 1, comprising a wall and said alignment structure on one surface thereof for providing a single desired alignment to said liquid crystal director.

12. (previously presented) A method of manufacturing a cell wall in accordance with claim 11, comprising applying a photoresist material to a surface of said wall, exposing the applied photoresist material to a suitable light source through a suitably patterned mask, removing soluble photoresist, and hardening the exposed photoresist material to produce said two dimensional array of alignment posts on said wall; said method excluding any method which produces a sinusoidal bigrating.

13. (previously presented) A method of manufacturing a cell wall in accordance with claim 11, comprising applying a plastics material to a surface of said wall, and embossing said two dimensional array of alignment posts into said plastics material; said method excluding any method which produces a sinusoidal bigrating.

14. (previously presented) A method of manufacturing a liquid crystal device in accordance with claim 1, comprising:

Application Ser. No. 09/816,941

Art Unit 2871

securing a first cell wall to a second cell wall, so as to produce a cell having spaced apart cell walls;
filling the cell with a liquid crystal material, and sealing the cell;
wherein one or both of said first cell wall and said second cell wall have at least one electrode structure thereon so that said liquid crystal device has electrode structures for applying an electric field across at least some of said liquid crystal material;
wherein said first cell wall comprises a wall and said two dimensional array of alignment posts on one surface thereof for providing a single desired alignment to said liquid crystal director,
wherein said first cell wall is manufactured by a method comprising applying a plastics material to the surface of a wall, and embossing said two dimensional array of alignment posts into said plastics material.

15. (withdrawn) A liquid crystal device comprising:
a first cell wall and a second cell wall enclosing a layer of liquid crystal material;
electrodes for applying an electric field across at least some of said liquid crystal material; and
a surface alignment structure on the inner surface of at least said first cell wall providing at least one of a desired homeotropic or tilted homeotropic alignment to a liquid crystal director;
wherein said surface alignment structure comprises a two dimensional array of alignment posts which are at least one of shaped and orientated to produce the desired alignment.

16. (withdrawn) A device as claimed in claim 15, wherein said posts have a height that is at least equal to the average spacing between said posts.

17. (withdrawn) A device as claimed in claim 15, wherein at least part of a side wall of said posts is tilted with respect to the normal to the plane of said first cell wall.

Application Ser. No. 09/816,941

Art Unit 2871

18. (withdrawn) A liquid crystal device comprising:

a first cell wall and a second cell wall enclosing a layer of liquid crystal material;
electrodes for applying an electric field across at least some of said liquid crystal
material; and

a surface alignment structure on the inner surface of at least said first cell wall
providing a desired alignment to a liquid crystal director in a single azimuthal
direction;

wherein said surface alignment structure comprises a two dimensional array of
upstanding alignment posts which are at least one of shaped and orientated to
produce the desired alignment.

19. (withdrawn) A device as claimed in claim 18, wherein the posts are tilted with
respect to the normal of the plane of the first cell wall.

20. (withdrawn) A device as claimed in claim 18, wherein each post comprises a
discrete structure.

21. (canceled)

22. (withdrawn) A liquid crystal device comprising:

a first cell wall and a second cell wall enclosing a layer of liquid crystal material;
electrodes for applying an electric field across at least some of said liquid crystal
material; and

a surface alignment structure on the inner surface of at least said first cell wall
providing desired alignments to a liquid crystal director in at least three
azimuthal directions;

wherein said surface alignment structure comprises a two dimensional array of
alignment posts which are at least one of shaped and orientated to produce the
desired alignments.

23. (withdrawn) A liquid crystal device comprising:

Application Ser. No. 09/816,941

Art Unit 2871

a first cell wall and a second cell wall enclosing a layer of liquid crystal material; electrodes for applying an electric field across at least some of said liquid crystal material; and

a surface alignment structure on the inner surface of at least said first cell wall providing a single desired alignment to a liquid crystal director;

wherein said surface alignment structure comprises a two dimensional array of alignment posts which are shaped and/or oriented to produce the desired alignment; but not including any device in which said posts are treated with or formed from a material which will induce local homeotropic alignment in the liquid crystal material.

24. (previously presented) A device as claimed in claim 1, wherein said alignment posts have a square cross section.

25. (previously presented) A device as claimed in claim 1, wherein said alignment posts have a round cross section.

26. (previously presented) A device as claimed in claim 1, wherein said alignment posts have a triangular cross section.

27. (previously presented) A device as claimed in claim 1, wherein said alignment posts have an oval cross section.

28. (previously presented) A device as claimed in claim 1, wherein said liquid crystal material is a nematic liquid crystal.

29. (previously presented) A device as claimed in claim 1, further comprising one or more spacer posts, said one or more spacer posts spanning the entire cell.

30. (withdrawn) A device as claimed in claim 15, further comprising one or more spacer posts, said one or more spacer posts spanning the entire cell.

Application Ser. No. 09/816,941

Art Unit 2871

31. (withdrawn) A device as claimed in claim 18, further comprising one or more spacer posts, said one or more spacer posts spanning the entire cell.

32. (withdrawn) A device as claimed in claim 22, further comprising one or more spacer posts, said one or more spacer posts spanning the entire cell.

33. (withdrawn) A device as claimed in claim 23, further comprising one or more spacer posts, said one or more spacer posts spanning the entire cell.